CLAIM

1. An orthogonal frequency multi-carrier transmitting apparatus which arranges plural symbols to be transmitted on the frequency axis as plural sub-carrier signal components of a frequency interval equal to the symbol rate, then converts them to time domain signals, then up converts these signals and amplifies their power, thereafter transmitting them, comprising:

an inverse Fourier transform part which transforms said plural sub-carrier signal components to plural time domain signal components;

a peak component detecting part which compares each of said plural time domain signals with a predetermined permissible peak level to detect peak components exceeding said permissible peak level;

a Fourier transform part which transforms said peak components to frequency domain components corresponding to said sub-carrier signal components; and

subtracting means which subtract said frequency domain components from said plural sub-carrier signal components to be input to said inverse Fourier transform part, thereby suppressing the peak component of the transmitting output.

2. The orthogonal frequency multi-carrier transmitting apparatus as recited in claim 1, wherein said peak component detecting part sets said peak components at zero when the levels of the time domain signal components output from said subtracting means are equal to or lower than said permissible peak level, and uses the differences between said time domain signal components and said permissible peak level as said peak components when the levels of said time domain signal components exceeds said permissible peak level.

3. The orthogonal frequency multi-carrier transmitting apparatus as recited in claim 1, wherein a permissible peak level setting part is provided which determines said permissible peak level in accordance with the level of the power-amplified transmitting signal.

4. The orthogonal frequency multi-carrier transmitting apparatus as recited in claim 1 or 3, which further comprises a Fourier-transformed output signal control part which compares the level of each of said frequency domain components from said Fourier transform part with a predetermined peak-reduced signal permissible level, and controls the level of said each frequency domain component to become equal to or lower than said peak-reduced signal permissible level.

5. The orthogonal frequency multi-carrier transmitting apparatus as recited in claim 1, which further comprises:

plural copying parts each of which copies one of said plural symbols to a number SF that is equal to the value of a spreading factor, said SF being an integer equal to or greater than 1;

a spreading code generating part which generates spreading codes; and

multiplying means which spread the outputs from said plural copying parts by said spreading codes and outputs the spread results as said plural sub-carrier signal components.

6. The orthogonal frequency multi-carrier transmitting apparatus as recited in claim 1, which further comprises:

plural copying parts each of which copies one of plural symbols to a number SF that equal to the value of a spreading factor, in each of plural routes to which plural symbols are input, said SF being an integer equal to or greater than 1;

a spreading code generating part which generates a spreading code for

each route;

multiplying means which spread the outputs from said plural copying parts of each route by said spreading code; and

a combining part which combines corresponding components of the outputs from the respective multiplying means of said plural routes and outputs the combined components as sub-carrier signal components of said plural routes.

7. The orthogonal frequency multi-carrier transmitting apparatus as recited in claim 6, wherein said spreading code generating part generates a short code as said spreading code; said transmitting apparatus further comprising:

a long code generating part which generates a long code; and

second multiplying means which multiply the outputs from the combining part by said long code and output multiplication results as said plural sub-carrier signal components.

8. The orthogonal frequency multi-carrier transmitting apparatus as recited in any one of claims 1 to 7, wherein a set of said inverse Fourier transform part, said peak component detecting part, said Fourier transform part and said subtracting means is formed by a memory in which there are stored time domain signal components that are obtained when peak reduction processing by said inverse Fourier transform part, said peak component detecting part, said Fourier transform part and said subtracting means is performed in advance for each possible combination of the respective sub-carrier components until peak components become equal to or lower than said permissible peak level.

9. An orthogonal frequency multi-carrier transmitting method which arranges plural symbols to be transmitted on the frequency axis as

plural sub-carrier signal components of a frequency interval equal to the symbol rate, then converts them to time domain signals, then up converts these signals and amplifies their power, thereafter transmitting them, comprising:

(a) a step of performing inverse Fourier transform processing of said plural sub-carrier signal components to transform them to plural time domain signal components;

(b) a step of comparing each of said plural time domain signal components with a predetermined permissible peak level to detect peak components exceeding said permissible peak level;

(c) a step of Fourier-transforming said peak components to frequency domain components corresponding to said sub-carrier signal components; and

(d) a step of subtracting said frequency domain components from said plural sub-carrier signal components to thereby suppress the peak component of a transmitting output.

10. The orthogonal frequency multi-carrier transmitting method as recited in claim 9, wherein said steps (a), (b) and (c) are repeatedly performed until the levels of all of said plural time domain signal components become equal to or lower than said permissible peak level in said step (b).

11. The orthogonal frequency multi-carrier transmitting method as recited in claim 9, wherein the time domain signal components corresponding to said sub-carrier signal components are read out from a memory in which there are stored time domain signal components that are obtained when peak reduction processing by said steps (a), (b), (c) and (d) is performed in advance for each possible combination of the respective sub-carrier components until peak components become equal to or lower than said permissible peak level.